

Nanocrystalline hardystonite synthesized by solid state process as a novel bioceramic for medical purposes; preparation and characterization. / E. Karamian, H. Gheisari. / Nano Studies. – 2015. – # 11. – pp. 87-94. – eng.

In this study, Hardystonite powder ($\text{Ca}_2\text{ZnSi}_2\text{O}_7$) was synthesized by mechanical activation method as a solid state process. Specimens were composed of a blend of pure calcite, silica amorphous and ZnO with 50, 30 and 20 wt. %, respectively. These powders were milled by high energy ball mill using ball-to-powder ratio 10 : 1 and rotation speed (600 rpm) for 5 and 10 h. Then, the mixtures mechanical activated have been heated at 1100 °C for 3 h. XRD, SEM and BET performed on the samples to characterize. According to XRD results, the sample milled for 10 h just indicated the Hardystonite phase, with crystal size about 40 nm, while the sample milled for 5 h illustrate Hardystonite phase along with several phases. Based on energy transfer analysis, the energy amount transferred to the starting materials is 11.2 MJ /g for 10 h, causes the synthesis temperature reduces to 1100 °C. Fig. 6, Tab. 1, Ref. 20.

Auth.